

Docker No. F-7369

Ser. No. 10/089,015

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A pulley unit comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

at least one rolling bearing disposed in said annular space, said at least one rolling bearing including a roller bearing on at least axially one side of said one-way clutch; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said roller bearing;

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said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said roller bearing;

said one-way clutch and said roller bearing each includes a plurality of rollers interposed between said outer ring raceway and the inner ring raceway in the circumferential direction, and a retainer having a plurality of pockets each accommodating said rollers one each;

said retainer of said roller bearing has an annular portion facing to a side of a first seal ring of said seal rings, an outer cylindrical circumferential surface extending axially inward from said annular portion and having a first retainer diameter, a second retainer diameter greater than said first retainer diameter, and at least one radially planar surface extending from said outer cylindrical circumferential surface to said second retainer diameter ~~said annular portion having an outer diameter which is reduced in diameter with respect to a remaining diameter of the retainer~~ thereby defining a step between ~~said outer diameter of said annular portion and said remaining~~ second retainer diameter, so as to increase a storage volume for lubricating oil between said roller bearing and said first seal ring.

2. (Previously Presented) A pulley unit according to claim 1, wherein said rollers of said roller bearing are generally cylindrical in shape.

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3. (Currently Amended) A pulley unit according to claim 1, wherein
[[an]] said inner diametrical surface of said pulley between said one-way clutch
and a given one of said at least one rolling bearing is provided with a recess
which increases said storage volume for the lubricating oil in said annular
space.

4. (Previously Presented) A pulley unit according to claim 1,
wherein said at least one rolling bearing further includes a ball bearing
comprising an other retainer for holding balls, said other retainer having an
annular portion facing to a side of a second seal ring of said seal rings, said
annular portion of said other retainer having an inner diameter side tapered so
as to gradually increase in diameter toward an axially outer end thereof.

5. (Previously Presented) A pulley unit according to claim 4,
wherein in said other retainer of said ball bearing, said annular portion facing to
the side of the second seal ring has an outer diameter side tapered so as to
gradually decrease in diameter toward the axially outer end thereof.

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6. (Currently Amended) A pulley unit according to claim 1, wherein at least one of said ~~rolling elements~~ roller of said at least one ~~rolling~~ roller bearing is made of resin including lubricating oil.

7. (Currently Amended) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

a rolling bearing disposed in said annular space on at least axially one side of said one-way clutch;

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space; and

a lubricating oil-impregnating body;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said rolling bearing;

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said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearing;

said one-way clutch and said rolling bearing each includes a plurality of rolling elements interposed between said outer ring raceway and the inner ring raceway in the circumferential direction, and a retainer having a plurality of pockets each accommodating said rolling elements one each;

said retainer of said rolling bearing has an annular portion facing to the side of said seal ring, said annular portion having an outer diameter side which is reduced in diameter so as to increase a storage volume for lubricating oil between said rolling bearing and said seal ring;

[[an]] said inner diametrical surface of said pulley between said one-way clutch and said rolling bearing is provided with a recess which increases said storage volume for the lubricating oil in said annular space; and

said lubricating oil-impregnating body is accommodated and held in said recess.

8. (Currently Amended) A pulley unit, comprising:
a pulley;

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a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

a rolling bearing disposed in said annular space on at least axially one side of the one-way clutch and comprising a retainer for holding rolling elements; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said rolling bearing;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearing;

said one-way clutch and said rolling bearing each include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each; and

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a recess for increasing a storage volume for lubricating oil in said annular space is provided in said inner diametrical surface of said pulley between said one-way clutch and said rolling bearing.

9. (Original) A pulley unit according to claim 8, wherein at least one of said rolling elements of said rolling bearing is made of resin including lubricating oil.

10. (Currently Amended) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

a rolling bearing disposed in said annular space on at least axially one side of the one-way clutch and comprising a retainer for holding rolling elements;

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seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space; and

a lubricating oil impregnating body;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said rolling bearing;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearing;

said one-way clutch and said rolling bearing each include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

a recess for increasing a storage volume for lubricating oil in said annular space is provided in ~~[[an]]~~ said inner diametrical surface of said pulley between said one-way clutch and said rolling bearing; and

said lubricating oil-impregnating body is accommodated and held in said recess.

11. (Currently Amended) A pulley unit, comprising:

a pulley;

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a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

rolling bearings disposed in said annular space on opposite sides of said one-way clutch; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said rolling bearings;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearings;

said one-way clutch and rolling bearings include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

at least one of said rolling bearings being a roller bearing, at least one of said retainers corresponding to said roller bearing having an annular portion

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facing to the side of at least a first seal ring of said seal rings, an outer cylindrical circumferential surface extending axially inward from said annular portion and having a first retainer diameter, a second retainer diameter greater than said first retainer diameter, and at least one radially planar surface extending from said outer cylindrical circumferential surface to said second retainer diameter ~~said annular portion having an outer diameter which is reduced in diameter with respect to a remaining diameter of the retainer thereby defining a step between said outer diameter of said annular portion and said remaining second retainer diameter, so as to increase a storage volume for lubricating oil between said seal ring opposing the annular portion in an axial direction said roller bearing and said first seal ring.~~

12. (Previously Presented) A pulley unit according to claim 11, wherein said rolling elements of said roller bearing are generally cylindrical in shape.

13. (Currently Amended) A pulley unit according to claim 11, wherein ~~[[an]]~~ said inner diametrical surface of said pulley between said one-way clutch

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and at least one of said rolling bearings is provided with a recess which increases a storage volume of lubricating oil in said annular space.

14. (Previously Presented) A pulley unit according to claim 11, wherein an other of said rolling bearings is a ball bearing comprising an other retainer for holding balls, said other retainer including an annular portion facing to a side of a second seal ring of said seal rings, said annular portion having an inner diameter side tapered so as to gradually increase in diameter toward an axially outer end thereof.

15. (Previously Presented) A pulley unit according to claim 14, wherein said annular portion of said other retainer of said ball bearing has an outer diameter side tapered so as to gradually decrease in diameter toward the axially outer end thereof.

16. (Currently Amended) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

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a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

rolling bearings disposed in said annular space on opposite sides of said one-way clutch;

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space; and

a lubricating oil impregnating body;

wherein said inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch and said rolling bearings;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearings;

said one-way clutch and rolling bearings include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

said retainers of said rolling bearings each has an annular portion facing to the side of said seal ring, said annular portion having an outer diameter side reduced in diameter so as to increase a storage volume for lubricating oil between said seal ring opposing in an axial direction; and

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said ~~[[an]]~~ inner diametrical surface of said pulley between said one-way clutch and at least one of said rolling bearings is provided with a recess which increases a storage volume of lubricating oil in said annular space;

said lubricating oil-impregnating body is accommodated and held in said recess.

17. (Currently Amended) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

a ball bearing provided on axially one side of the one-way clutch in said annular space;

a roller bearing provided on axially other side of the one-way clutch in said annular space; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

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wherein an inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch, the ball bearing and the roller bearing;

said ~~[[an]]~~ outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch, said ball bearing and said roller bearing;

said one-way clutch, said ball bearing and said roller bearing each include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

said retainers of said ball bearing and said roller bearing each have an annular portion facing to the side of a corresponding one of said seal rings, said annular ~~portion~~ portions having an outer diameter side reduced in diameter so as to increase a storage volume for lubricating oil between said retainers and said seal rings opposed to the annular portions in the axial direction, said annular portion of said roller bearing having an outer diameter smaller than a remaining diameter of the retainer thereby defining a step between said outer diameter of said annular portion and said remaining diameter said retainer of said roller bearing having an outer cylindrical circumferential surface extending axially inward from said annular portion and having a first retainer diameter, a second

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retainer diameter greater than said first retainer diameter, and at least one radially planar surface extending from said outer cylindrical circumferential surface to said second retainer diameter thereby defining a step between said annular portion and said second retainer diameter, so as to increase a storage volume for lubricating oil between said roller bearing and said first seal ring.

18. (Currently Amended) A pulley unit according to claim 17, wherein ~~[[an]]~~ said inner diametrical surface of said pulley between said one-way clutch and the ball bearing is provided with a recess which increases the storage volume of the lubricating oil in said annular space.

19. (Currently Amended) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed ~~in an inner diameter side~~ inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between ~~[[an]]~~ the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

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a ball bearing provided on axially one side of the one-way clutch in said annular space;

a roller bearing provided on axially other side of the one-way clutch in said annular space;

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space; and

a lubricating oil-impregnating body;

wherein said ~~[[an]]~~ inner diametrical surface of said pulley forms an outer ring raceway of each of said one-way clutch, the ball bearing and the roller bearing;

said ~~[[an]]~~ outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch, said ball bearing and said roller bearing;

said one-way clutch, said ball bearing and said roller bearing each include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

said retainers of said ball bearing and said roller bearing each have an annular portion facing to the side of said seal ring, said annular portion having

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an outer diameter side reduced in diameter so as to increase a storage volume for lubricating oil between said seal rings opposed to each other in their axial direction;

said ~~[[an]]~~ inner diametrical surface of said pulley between said one-way clutch and the ball bearing is provided with a recess which increases the storage volume of the lubricating oil in said annular space; and

said lubricating oil-impregnating body is accommodated and held in said recess.

20. (Previously Presented) A pulley unit according to claim 17, wherein said annular portion of said retainer of said ball bearing has an inner diameter side tapered so as to gradually increase in diameter toward an axially outer end thereof and an outer diameter side tapered so as to gradually decrease in diameter toward said axially outer end.

21. (Original) A pulley unit according to claim 17, wherein the outer diametrical surface of said shaft body includes an axially one region where said ball bearing is disposed, an axially intermediate region where said one-way clutch is disposed, and an axially other region where said roller bearing is disposed, each of said regions forms the inner ring raceway of each of the

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one-way clutch, the ball bearing and the roller bearing, an outer diameter of said axially one region where said ball bearing is disposed, is larger than an outer diameter of said axially other region where said roller bearing is disposed.

22. (New) A pulley unit comprising:

a pulley;

a shaft body concentrically disposed inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

at least one rolling bearing disposed in said annular space, said at least one rolling bearing including a roller bearing on at least axially one side of said one-way clutch; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

said inner diametrical surface of said pulley forming an outer ring raceway of each of said one-way clutch and said roller bearing;

said inner diametrical surface of said pulley being provided with a recess between said one-way clutch and a given one of said at least one rolling bearing

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which increases said storage volume for the lubricating oil in said annular space;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said roller bearing;

said one-way clutch and said roller bearing each includes a plurality of rollers interposed between said outer ring raceway and the inner ring raceway in the circumferential direction, and a retainer having a plurality of pockets each accommodating said rollers one each;

said retainer of said roller bearing has an annular portion facing to a side of a first seal ring of said seal rings, said annular portion having an outer diameter which is reduced in diameter with respect to a remaining diameter of the retainer thereby defining a step between said outer diameter of said annular portion and said remaining diameter, so as to increase a storage volume for lubricating oil between said roller bearing and said first seal ring.

23. (New) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

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a one-way clutch interposed in an annular space between the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

rolling bearings disposed in said annular space on opposite sides of said one-way clutch; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

said inner diametrical surface of said pulley forming an outer ring raceway of each of said one-way clutch and said rolling bearings, said inner diametrical surface of said pulley being provided with a recess between said one-way clutch and at least one of said rolling bearings which increases a storage volume of lubricating oil in said annular space;

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch and said rolling bearings;

said one-way clutch and rolling bearings include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

at least one of said rolling bearings being a roller bearing, at least one of said retainers corresponding to said roller bearing having an annular portion

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facing to the side of at least a first seal ring of said seal rings, said annular portion having an outer diameter which is reduced in diameter with respect to a remaining diameter of the retainer thereby defining a step between said outer diameter of said annular portion and said remaining diameter, so as to increase a storage volume for lubricating oil between said roller bearing and said first seal ring.

24. (New) A pulley unit, comprising:

a pulley;

a shaft body concentrically disposed inside of an inner diametrical surface of said pulley and in a relatively rotatable relationship with said pulley;

a one-way clutch interposed in an annular space between the inner diametrical surface of said pulley and an outer diametrical surface of said shaft body;

a ball bearing provided on axially one side of the one-way clutch in said annular space;

a roller bearing provided on axially other side of the one-way clutch in said annular space; and

seal rings disposed on each of axially one end and axially other end of said annular space for sealing said annular space;

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an inner diametrical surface of said pulley forming an outer ring raceway of each of said one-way clutch, the ball bearing and the roller bearing, said inner diametrical surface of said pulley being provided with a recess between said one-way clutch and the ball bearing which increases the storage volume of the lubricating oil in said annular space.

said outer diametrical surface of said shaft body forms an inner ring raceway of each of said one-way clutch, said ball bearing and said roller bearing;

said one-way clutch, said ball bearing and said roller bearing each include a plurality of rolling elements interposed between said outer ring raceway and said inner ring raceway in the circumferential direction, and include a retainer having a plurality of pockets each accommodating said rolling elements one each;

said retainers of said ball bearing and said roller bearing each have an annular portion facing to the side of a corresponding one of said seal rings, said annular portions having an outer diameter side reduced in diameter so as to increase a storage volume for lubricating oil between said retainers and said seal rings opposed to the annular portions in the axial direction, said annular portion of said roller bearing having an outer diameter smaller than a remaining

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diameter of the retainer thereby defining a step between said outer diameter of said annular portion and said remaining diameter.